

REDESCRIPTION OF *BETHULIA CHAMPIONELLA* RAGONOT  
(LEPIDOPTERA: PYRALIDAE: PHYCITINAE)

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*Abstract.*—Based on a single female specimen, Ragonot (1888) described the genus *Bethulia* and its included species *B. championella*. Recently, additional specimens of both sexes of this small phycitine have been collected, chiefly in the Neotropics. Using this new material, the genus and species are redescribed, and the male genitalia are illustrated for the first time.

*Key Words:* Phycitinae, southwestern United States, Mexico, Central America, South America

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*Bethulia* is a monotypic genus whose sole species *B. championella* was described by Ragonot in 1888 based on a single specimen collected in San Joaquin, Verapaz, Guatemala. Subsequent descriptions of the species, all also based only on the type, were published by Druce (1896), Ragonot and Hampson (1901), and Heinrich (1956). Figures of *B. championella* were included in Druce (1896: table 64, fig. 10), and in Ragonot and Hampson (1901: plate xxxv, fig. 16), and illustrations of the wing venation and genitalia were given by Heinrich (1956: figs. 123, 1120). Heinrich also established that the type was a female and not a male as stated by Ragonot (1888).

Additional *B. championella* specimens recently have been collected in the southwestern United States, Mexico, Central America, and northern South America. This material includes moths of both sexes, and it is now possible to provide a more complete account of the genus and species.

Specimens studied came from the follow-

ing sources: Instituto Nacional de Biodiversidad, Santo Domingo, Costa Rica [IN-BIO]; The North Carolina State University Insect Collection, Raleigh, North Carolina, U.S.A. [NCSU]; the National Museum of Natural History, Smithsonian Institution, Washington, D.C., U.S.A. [USNM]; Collection of Vitor O. Becker, Universidade do Brasilia, Brasil [VOB]; and The Natural History Museum, London, England [BMNH].

*Bethulia* Ragonot

*Bethulia* Ragonot 1888: 37. Type species: *Bethulia championella* Ragonot, 1888, original designation.

*Description.*—*Head:* Male antenna with basal half of shaft slightly swollen; female antenna simple; in both sexes frons with anteriorly projecting cone of scales, vertex rough-scaled, labial palpus porrect to slightly oblique and extending beyond head for distance about equal to length of head, maxillary palpus short-scaled, haustellum



Fig. 1. Habitus of male *Bethulia championella*.

moderately well developed and ocellus present. *Forewing*: Both sexes with 9 veins;  $R_{3+4}$  completely fused with  $R_5$ ;  $M_1$  from slightly posterior of anterodistal angle of cell;  $M_2$  and  $M_3$  completely fused;  $CuA_1$  from posterodistal angle of cell;  $CuA_2$  from before posterodistal angle of cell. *Hindwing*: Both sexes with 6 veins (1A, 2A, and 3A together treated as one vein);  $Sc + R_1$  completely fused with  $R_5$ ;  $M_2$  and  $M_3$  completely fused with each other;  $CuA_1$  from posterodistal angle of cell;  $CuA_2$  from well before posterodistal angle of cell. Male abdominal segment 8 without scale tuft. *Male genitalia* (Figs 2, 3): Uncus subtriangular, broadly rounded apically; gnathos with median, apical part strongly sclerotized, tonguelike; transtilla well developed with lateral arms forming a broad bridge posteriorly; juxta U-shaped with fingerlike, setiferous, lateral, posteriorly-projecting lobes; valva moderately elongate (when extending posteriorly projects beyond uncus); aedoeagus simple, vesica unarmed, vinculum slightly longer than greatest width. *Female genitalia* (Fig. 4): Ostium bursae well sclerotized, broadly flaring, with convex posterior margin; ductus bursae lightly sclerotized with band of microspines pos-

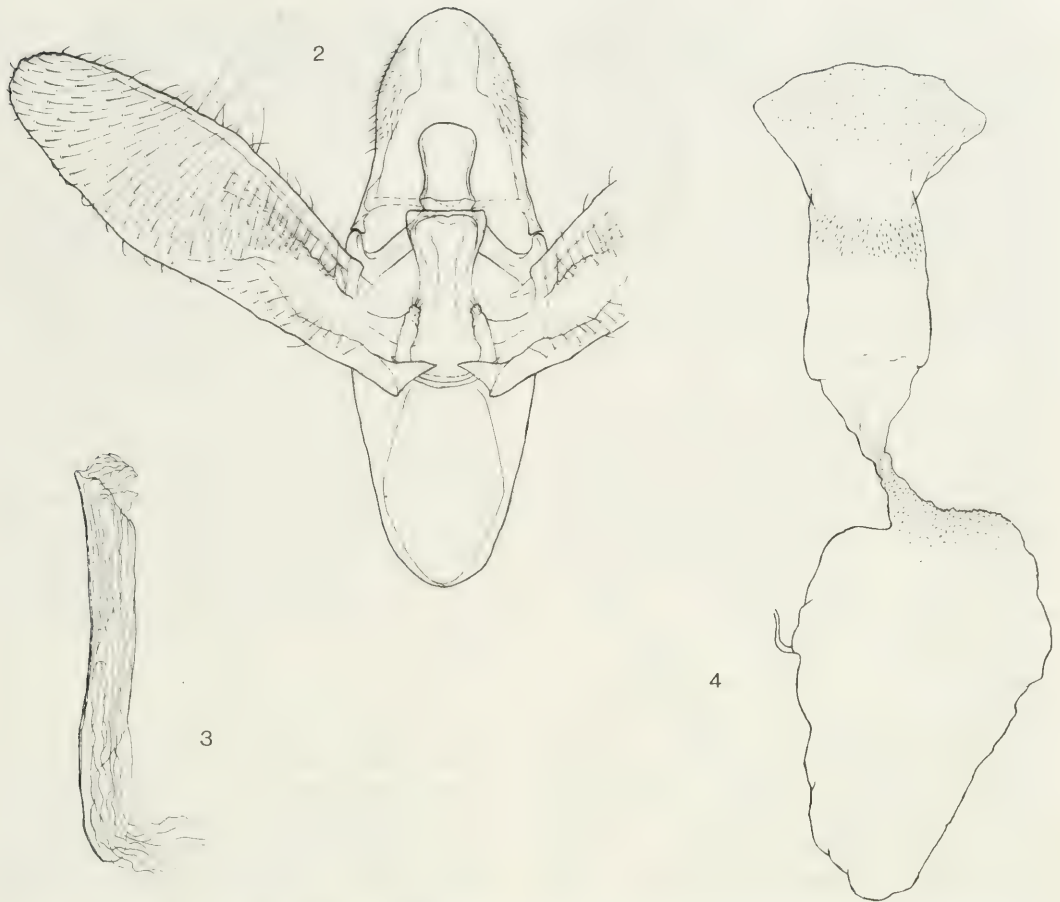
teriorly and scobinate anteriorly; corpus bursae oval, about as long as ostium bursae and ductus bursae combined, scobinate where it joins ductus bursae, and without signum (Heinrich's 1956 figure 1120 shows a dark, slightly-curved, signum-like feature in the corpus bursae but close examination reveals this to be an ink smudge on one of the curved lines; also, Heinrich, in his description of the female genitalia (p. 297) states "... there is no signum"); ductus seminalis from about middle of corpus bursae.

Comments.—Heinrich (1956) was of the opinion that *Bethulia* is closely related to *Plodia* Guénée and *Ribua* Heinrich. His assessment was based on similar wing venation and female genitalia among the three genera. The appearance of the male genitalia of *Bethulia*, in general, supports this view, particularly with regard to *Plodia*.

*Bethulia championella* Ragonot  
(Figs. 1–4)

*Bethulia championella* Ragonot 1888:37.

Description.—*Head*: Frons mostly black with some white scales dorsally; vertex white with a few black scales on some



Figs. 2–4. *Bethulia championella*. 2, Male genitalia, aedeagus omitted. 3, Aedeagus. 4, Female genitalia.

specimens; labial palpus outwardly mostly, to half, white basally, black distally; maxillary palpus outwardly white to black basally, black distally. *Thorax*: Dorsum of prothorax white with patches or spots of black. *Forewing*: Length 5.0–6.0 mm, upper surface mostly white with scattered black scales; antemedial and postmedial lines white, concolorous with white of wing; small black patch at base of wing on anterior half; black, transverse line bordering antemedial line, and a similar black line associated with postmedial line; series of black patches along distal margin of wing; discal spots black, separate; underside of wing suffused with black except for white streak along posterior margin. *Hindwing*:

Mostly white in male with brown along margins; grey in female with black along veins and wing margins; underside of both sexes suffused with black along costal margin. *Male and female genitalia*: As described for genus.

Material examined.—U.S.A.: 1 ♂, 1 ♀, Arizona, Coconino Co., Vail Lake Rd. 6,500', 9 ½ mi SE Flagstaff, 11 July 1961, Ronald W. Hodges, genitalia slides 773 HHN, 774 HHN [USNM]. 3 ♂, Arizona, Pima Co., Summerhaven, 7, 800', July 2, 1998, Sept. 17, 2001, June 16, 2002, R. B. Nagle, genitalia slide 6334 HHN [USNM]. 1 ♂, Arizona, Pima Co., Summerhaven, June 17, 2002, B. Nagle, genitalia slide 113, 035 JAL [USNM]. 4 ♂, 1 ♀, New



Mexico, Lincoln Co., Capitan Mts. near Nogel, I-VIII-1989, Wagner and Epstein, genitalia slides 3588 HHN, 3589 HHN [USNM]. MEXICO: 1 ♀, Chihuahua, Basaseachic, 1,930 m, 28°10'57"N, 108°12'42"W, 6 VIII 2002, Balcázar y Solís [USNM]. 1 ♀, Tamaulipas, Gomes Farías, 1,000 m, 29-31 VII 1988, Becker No. 69685, V. O. Becker and M. A. Solís, genitalia slide 6120 HHN [NCSU]. GUATEMALA: 1 ♀ (holotype), Verapaz, San Joaquín, 6,000', Rogers [BMNH]. COSTA RICA: 1 ♀, Cartago, Turrialba, 22-28-II-65, S. S. & W. D. Duckworth, genitalia slide 6337 HHN [USNM]. 1 ♂, 1 ♀, Guanacaste Province, Estacion Cacao, Lado Suroeste del Volcan Cacao, 1,000-1,400 m, 25 Set.-11 Oct.-1990, C. Chaves, LN323300, 375700, INBIO CRI000 590637, INBIO CRI000 576672, genitalia slides 4764 HHN, 4765 HHN [INBIO]. 1 ♂, Heredia, Refugio Vara Blanca, 6 km ENE Vara Blanca, 1,900 m, 10°11'N, 84°07'W, 14.IV.2002, D. & M. Davis [USNM]. 1 ♂, Prov. Cartago, El Guarco, R. F. Rio Macho, Macizo de la Muerte, Sector de la Esperanza, 2,600 m, Apr. 2002, R. Delgado, Tp de Luz, LN 185600 550000, # 67819 [INBIO]. PANAMA: 11 ♂, Cerro Campana, nr. Chica, 2-5-IV-65, S. S. & W. D. Duckworth, genitalia slides 6335, 6336 HHN [USNM; NCSU]. ECUADOR: 2 ♂, Santiago Morona, Gualaquiza, 900 m, 19 XII 1992, V. O. Becker, genitalia slides 5864 HHN, 5933

HHN [VOB]. 1 ♀, Tungurahua, Rio Verde, 1,600 m, 26 XII 1992, Becker no. 103981, V. O. Becker, genitalia slide 5847 HHN [NCSU].

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